

Keramikrestaurationen: Einsatz von Retraktionspaste für detailgetreuen Scan

1. Acar Ö, Erkut S, Özçelik TB, Ozdemir E, Akçil M. A clinical comparison of cordless and conventional displacement systems regarding clinical performance and impression quality. *J Prosthet Dent*. 2014 May; 111(5): 388–394.
2. Birnbaum NS, Aaronson HB, Stevens C, Cohen B. 3D digital scanners: a high-tech approach to more accurate dental impressions. *Inside Dentistry*. 2009; 5(4): 70–74.
3. Gupta A, Prithviraj DR, Gupta D, Shruti DP. Clinical evaluation of three new gingival retraction systems: a research report. *J Indian Prosthodont Soc*. 2013 Mar; 13(1): 36–42.
4. Kostić I, Najman S, Kostić M, Stojanović S. Comparative review of gingival retraction agents. *Acta medica Medianae*. 2012; 51(1): 81–84.
5. Nouri S, Sharif MR, Panahi Y, Ghanei M, Jamali B. Efficacy and safety of aluminum chloride in controlling external hemorrhage: an animal model study. *Iran Red Crescent Med J*. 2015 Mar 20; 17(3): e19714.
6. Phatale S, Marawar PP, Byakod G, Lagdive SB, Kalburge JV. Effect of retraction materials on gingival health: A histopathological study. *J Indian Soc Periodontol*. 2010 Jan; 14(1): 35–39.
7. Prasad KD, Hegde C, Agrawal G, Shetty M. Gingival displacement in prosthodontics: A critical review of existing methods. *J Interdisciplinary Dent*. 2011; 1(2), 80–86.
8. Qureshi SM, Anasane NS, Kakade D. Comparative evaluation of the amount of gingival displacement using three recent gingival retraction systems - in vivo study. *Contemp Clin Dent*. 2020 Jan–Mar; 11(1): 28–33.
9. Ting-Shu S, Jian S. Intraoral digital impression technique: a review. *J Prosthodont*. 2015 Jun; 24(4): 313–321.

Präprozedurale Mundspülungen zur Infektionsprophylaxe in der zahnärztlichen Praxis

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1. Zemouri C, Soet H de, Crielaard W, Laheij A (2017) A scoping review on bio-aerosols in healthcare and the dental environment. Plos One 12:e0178007.
<https://doi.org/10.1371/journal.pone.0178007>
2. Volgenant CMC, Soet JJ de (2018) Cross-transmission in the Dental Office: Does This Make You Ill? Curr Oral Heal Reports 5:221–228. <https://doi.org/10.1007/s40496-018-0201-3>
3. Harrel SK, Molinari J (2004) Aerosols and splatter in dentistry A brief review of the literature and infection control implications. J Am Dent Assoc 135:429–437.
<https://doi.org/10.14219/jada.archive.2004.0207>
4. Gallagher JE, K.C. S, Johnson IG, et al (2020) A systematic review of contamination (aerosol, splatter and droplet generation) associated with oral surgery and its relevance to COVID-19. Bdj Open 6:25. <https://doi.org/10.1038/s41405-020-00053-2>
5. Zemouri C, Volgenant CMC, Buijs MJ, et al (2020) Dental aerosols: microbial composition and spatial distribution. J Oral Microbiol 12:1762040.
<https://doi.org/10.1080/20002297.2020.1762040>
6. Zemouri C, Awad SF, Volgenant CMC, et al (2020) Modeling of the Transmission of Coronaviruses, Measles Virus, Influenza Virus, Mycobacterium tuberculosis, and Legionella pneumophila in Dental Clinics. J Dent Res 99:1192–1198.
<https://doi.org/10.1177/0022034520940288>
7. ODonnell MJ, Boyle MA, Russell RJ, Coleman DC (2011) Management of dental unit waterline biofilms in the 21st century. Future Microbiol 6:1209–1226.
<https://doi.org/10.2217/fmb.11.104>
8. Laheij AMGA, Kistler JO, Belibasakis GN, et al (2012) Healthcare-associated viral and bacterial infections in dentistry. J Oral Microbiol 4:17659.
<https://doi.org/10.3402/jom.v4i0.17659>
9. Rautemaa R, Nordberg A, Wuolijoki-Saaristo K, Meurman JH (2006) Bacterial aerosols in dental practice – a potential hospital infection problem? J Hosp Infect 64:76–81.
<https://doi.org/10.1016/j.jhin.2006.04.011>
10. Reinthaler FF, Mascher F, Stunzner D (1988) Serological Examinations for Antibodies against Legionella Species in Dental Personnel. J Dent Res 67:942–943.
<https://doi.org/10.1177/00220345880670061001>

11. Petti S, Vitali M (2017) Occupational risk for Legionella infection among dental healthcare workers: meta-analysis in occupational epidemiology. *Bmj Open* 7:e015374. <https://doi.org/10.1136/bmjopen-2016-015374>
12. Hilbi H, Hoffmann C, Harrison CF (2011) Legionella spp. outdoors: colonization, communication and persistence. *Env Microbiol Rep* 3:286–296. <https://doi.org/10.1111/j.1758-2229.2011.00247.x>
13. Loe H, Schiøtt CR (1970) The effect of mouthrinses and topical application of chlorhexidine on the development of dental plaque and gingivitis in man. *J Periodontal Res* 5:79–83. <https://doi.org/10.1111/j.1600-0765.1970.tb00696.x>
14. Gjermo P (1974) Chlorhexidine in dental practice. *J Clin Periodontol* 1:143–152. <https://doi.org/10.1111/j.1600-051x.1974.tb01250.x>
15. Litsky BY, Mascis JD, Litsky W (1970) Use of an antimicrobial mouthwash to minimize the bacterial aerosol contamination generated by the high-speed drill. *Oral Surg Oral Med Oral Pathol* 29:25–30. [https://doi.org/10.1016/0030-4220\(70\)90407-x](https://doi.org/10.1016/0030-4220(70)90407-x)
16. Mohammed CI, Manhold JH, Manhold BS (1964) Efficacy of preoperative oral rinsing to reduce air contamination during use of air turbine handpieces. *J Am Dent Assoc* 69:715–718. <https://doi.org/10.14219/jada.archive.1964.0379>
17. Mohammed CI, Monserrate V (1970) Preoperative oral rinsing as a means of reducing air contamination during use of air turbine handpieces. *Oral Surg Oral Med Oral Pathol* 29:291–294. [https://doi.org/10.1016/0030-4220\(70\)90100-3](https://doi.org/10.1016/0030-4220(70)90100-3)
18. Peng X, Xu X, Li Y, et al (2020) Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci* 12:9. <https://doi.org/10.1038/s41368-020-0075-9>
19. Izzetti R, Nisi M, Gabriele M, Graziani F (2020) COVID-19 Transmission in Dental Practice: Brief Review of Preventive Measures in Italy. *J Dent Res* 99:1030–1038. <https://doi.org/10.1177/0022034520920580>
20. Diegritz C, Manhart J, Bücher K, et al (2020) A detailed report on the measures taken in the Department of Conservative Dentistry and Periodontology in Munich at the beginning of the COVID-19 outbreak. *Clin Oral Invest* 24:2931–2941. <https://doi.org/10.1007/s00784-020-03440-z>
21. Ather A, Patel B, Ruparel NB, et al (2020) Coronavirus Disease 19 (COVID-19): Implications for Clinical Dental Care. *J Endodont* 46:584–595. <https://doi.org/10.1016/j.joen.2020.03.008>
22. Zimmermann M, Nkenke E (2020) Approaches to the management of patients in oral and maxillofacial surgery during COVID-19 pandemic. *J Craniomaxillofac Surg* 48:521–526. <https://doi.org/10.1016/j.jcms.2020.03.011>

23. Jamal M, Shah M, Almarzooqi SH, et al (2021) Overview of transnational recommendations for COVID-19 transmission control in dental care settings. *Oral Dis* 27:655–664. <https://doi.org/10.1111/odi.13431>
24. Carrouel F, Gonçalves LS, Conte MP, et al (2021) Antiviral Activity of Reagents in Mouth Rinses against SARS-CoV-2. *J Dent Res* 100:124–132. <https://doi.org/10.1177/0022034520967933>
25. Cieplik F, Jakubovics NS (2022) Preprocedural Mouthwashes for Reduction of SARS-CoV-2 Viral Load and Infectivity. *J Dent Res* 101:1421–1423. <https://doi.org/10.1177/00220345221110444>
26. Davies GE, Francis J, Martin AR, et al (1954) 1:6-di-4'-chlorophenyldiguanidohexane ("Hibitane"). Laboratory investigation of a new antibacterial agent of high potency. *Brit J Pharm Chemoth* 9:192–196. <https://doi.org/10.1111/j.1476-5381.1954.tb00840.x>
27. Cieplik F, Jakubovics NS, Buchalla W, et al (2019) Resistance Toward Chlorhexidine in Oral Bacteria – Is There Cause for Concern? *Front Microbiol* 10:587. <https://doi.org/10.3389/fmicb.2019.00587>
28. Kampf G (2018) Chlorhexidine Digluconate. In: *Antiseptic Stewardship: Biocide Resistance and Clinical Implications*. Springer Nature, Cham, Switzerland, pp 429–534
29. Jones CG (1997) Chlorhexidine: is it still the gold standard? *Periodontol* 2000 15:55–62. <https://doi.org/10.1111/j.1600-0757.1997.tb00105.x>
30. Gilbert P, Moore LE (2005) Cationic antiseptics: diversity of action under a common epithet. *J Appl Microbiol* 99:703–715. <https://doi.org/10.1111/j.1365-2672.2005.02664.x>
31. Quisno R, Foter MJ (1946) Cetyl Pyridinium Chloride. *J Bacteriol* 52:111–117. <https://doi.org/10.1128/jb.52.1.111-117.1946>
32. Mao X, Auer DL, Buchalla W, et al (2020) Cetylpyridinium Chloride: Mechanism of Action, Antimicrobial Efficacy in Biofilms, and Potential Risks of Resistance. *Antimicrob Agents Chemother* 64:. <https://doi.org/10.1128/aac.00576-20>
33. Apostolov K (1980) The effects of iodine on the biological activities of myxoviruses. *J Hyg* 84:381–388. <https://doi.org/10.1017/s0022172400026905>
34. McDonnell G, Russell AD (1999) Antiseptics and Disinfectants: Activity, Action, and Resistance. *Clin Microbiol Rev* 12:147–179. <https://doi.org/10.1128/cmr.12.1.147>
35. Gershenfeld L (1957) Povidone-iodine as a topical antiseptic. *Am J Surg* 94:938–939. [https://doi.org/10.1016/0002-9610\(57\)90086-7](https://doi.org/10.1016/0002-9610(57)90086-7)
36. Kanagalingam J, Feliciano R, Hah JH, et al (2015) Practical use of povidone-iodine antiseptic in the maintenance of oral health and in the prevention and treatment of common oropharyngeal infections. *Int J Clin Pract* 69:1247–1256. <https://doi.org/10.1111/ijcp.12707>

37. Gold SI (1983) Early Origins of Hydrogen Peroxide Use in Oral Hygiene: A Historical Note. *J Periodontol* 54:247–247. <https://doi.org/10.1902/jop.1983.54.4.247>
38. Marshall MV, Cancro LP, Fischman SL (1995) Hydrogen Peroxide: A Review of Its Use in Dentistry. *J Periodontol* 66:786–796. <https://doi.org/10.1902/jop.1995.66.9.786>
39. Leeuwen MPCV, Slot DE, Weijden GAV der (2011) Essential Oils Compared to Chlorhexidine With Respect to Plaque and Parameters of Gingival Inflammation: A Systematic Review. *J Periodontol* 82:174–194. <https://doi.org/10.1902/jop.2010.100266>
40. Adams D, Addy M (1994) Mouthrinses. *Adv Dent Res* 8:291–301. <https://doi.org/10.1177/08959374940080022401>
41. Vlachojannis C, Chrubasik-Hausmann S, Hellwig E, Al-Ahmad A (2015) A Preliminary Investigation on the Antimicrobial Activity of Listerine®, Its Components, and of Mixtures Thereof. *Phytother Res* 29:1590–1594. <https://doi.org/10.1002/ptr.5399>
42. Mandel ID (1994) Antimicrobial Mouthrinses: Overview and Update. *J Am Dent Assoc* 125:2S-10S. [https://doi.org/10.1016/s0002-8177\(94\)14001-x](https://doi.org/10.1016/s0002-8177(94)14001-x)
43. Fine DH (1988) Mouthrinses as adjuncts for plaque and gingivitis management. A status report for the American Journal of Dentistry. *Am J Dent* 1:259–63
44. Cieplik F, Kara E, Muehler D, et al (2019) Antimicrobial efficacy of alternative compounds for use in oral care toward biofilms from caries-associated bacteria in vitro. *MicrobiologyOpen* 8:e00695. <https://doi.org/10.1002/mbo3.695>
45. Saad NY, Muller CD, Lobstein A (2013) Major bioactivities and mechanism of action of essential oils and their components. *Flavour Fragr J* 28:269–279. <https://doi.org/10.1002/ffj.3165>
46. Vlachojannis C, Al-Ahmad A, Hellwig E, Chrubasik S (2016) Listerine® Products: An Update on the Efficacy and Safety. *Phytother Res* 30:367–373. <https://doi.org/10.1002/ptr.5555>
47. Marui VC, Souto MLS, Rovai ES, et al (2019) Efficacy of preprocedural mouthrinses in the reduction of microorganisms in aerosol A systematic review. *J Am Dent Assoc* 150:1015-1026.e1. <https://doi.org/10.1016/j.adaj.2019.06.024>
48. Koletsi D, Belibasakis GN, Eliades T (2020) Interventions to Reduce Aerosolized Microbes in Dental Practice: A Systematic Review with Network Meta-analysis of Randomized Controlled Trials. *J Dent Res* 99:1228–1238. <https://doi.org/10.1177/0022034520943574>
49. Mohd-Said S, Mohd-Dom TN, Suhaimi N, et al (2021) Effectiveness of Pre-procedural Mouth Rinses in Reducing Aerosol Contamination During Periodontal Prophylaxis: A Systematic Review. *Front Med* 8:600769. <https://doi.org/10.3389/fmed.2021.600769>

50. Nagraj SK, Eachempati P, Paisi M, et al (2022) Preprocedural mouth rinses for preventing transmission of infectious diseases through aerosols in dental healthcare providers. *Cochrane Db Syst Rev* 2022:CD013826.
<https://doi.org/10.1002/14651858.cd013826.pub2>
51. Dawson M, Soro V, Dymock D, et al (2016) Microbiological assessment of aerosol generated during debond of fixed orthodontic appliances. *Am J Orthod Dentofac* 150:831–838. <https://doi.org/10.1016/j.ajodo.2016.04.022>
52. Fine DH, Furgang D, Korik I, et al (1993) Reduction of viable bacteria in dental aerosols by preprocedural rinsing with an antiseptic mouthrinse. *Am J Dent* 6:219–21
53. Paul B, Baiju RMP, Raseena NB, et al (2020) Effect of aloe vera as a preprocedural rinse in reducing aerosol contamination during ultrasonic scaling. *J Indian Soc Periodontol* 24:37–41. https://doi.org/10.4103/jisp.jisp_188_19
54. Logothetis DD, Martinez-Welles JM (1995) Reducing bacterial aerosol contamination with a chlorhexidine gluconate pre-rinse. *J Am Dent Assoc* 126:1634–1639.
<https://doi.org/10.14219/jada.archive.1995.0111>
55. Cieplik F, Aparicio C, Kreth J, Schmalz G (2022) Development of standard protocols for biofilm-biomaterial interface testing. *Jada Found Sci* 1:100008.
<https://doi.org/10.1016/j.jfscie.2022.100008>
56. Pearson RD, Steigbigel RT, Davis HT, Chapman SW (1980) Method of reliable determination of minimal lethal antibiotic concentrations. *Antimicrob Agents Chemother* 18:699–708. <https://doi.org/10.1128/aac.18.5.699>
57. Taylor PC, Schoenknecht FD, Sherris JC, Linner EC (1983) Determination of minimum bactericidal concentrations of oxacillin for *Staphylococcus aureus*: influence and significance of technical factors. *Antimicrob Agents Chemother* 23:142–150.
<https://doi.org/10.1128/aac.23.1.142>
58. Fernandez M dos S, Guedes MIF, Langa GPJ, et al (2022) Virucidal efficacy of chlorhexidine: a systematic review. *Odontology* 110:376–392.
<https://doi.org/10.1007/s10266-021-00660-x>
59. Baqui AAMA, Kelley JJ, Jabra-Rizk MA, et al (2001) In vitro effect of oral antiseptics on human immunodeficiency virus-1 and herpes simplex virus type 1. *J Clin Periodontol* 28:610–616. <https://doi.org/10.1034/j.1600-051x.2001.028007610.x>
60. Meiller TF, Silva A, Ferreira SM, et al (2005) Efficacy of Listerine® Antiseptic in reducing viral contamination of saliva. *J Clin Periodontol* 32:341–346.
<https://doi.org/10.1111/j.1600-051x.2005.00673.x>
61. O'Donnell VB, Thomas D, Stanton R, et al (2020) Potential Role of Oral Rinses Targeting the Viral Lipid Envelope in SARS-CoV-2 Infection. *Function* 1:zqaa002.
<https://doi.org/10.1093/function/zqaa002>

62. Bernstein D, Schiff G, Echler G, et al (1990) In vitro Virucidal Effectiveness of a 0.12%-Chlorhexidine Gluconate Mouthrinse. *J Dent Res* 69:874–876.
<https://doi.org/10.1177/00220345900690030901>
63. Kawana R, Kitamura T, Nakagomi O, et al (1997) Inactivation of Human Viruses by Povidone-Iodine in Comparison with Other Antiseptics. *Dermatology* 195:29–35.
<https://doi.org/10.1159/000246027>
64. Gottsauner MJ, Michaelides I, Schmidt B, et al (2020) A prospective clinical pilot study on the effects of a hydrogen peroxide mouthrinse on the intraoral viral load of SARS-CoV-2. *Clin Oral Invest* 24:1–7. <https://doi.org/10.1007/s00784-020-03549-1>
65. Meng L, Hua F, Bian Z (2020) Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. *J Dent Res* 99:481–487.
<https://doi.org/10.1177/0022034520914246>
66. Herrera D, Serrano J, Roldán S, Sanz M (2020) Is the oral cavity relevant in SARS-CoV-2 pandemic? *Clin Oral Invest* 24:2925–2930. <https://doi.org/10.1007/s00784-020-03413-2>
67. Meister TL, Brüggemann Y, Todt D, et al (2020) Virucidal Efficacy of Different Oral Rinses Against Severe Acute Respiratory Syndrome Coronavirus 2. *J Infect Dis* 222:jiaa471. <https://doi.org/10.1093/infdis/jiaa471>
68. Steinhauer K, Meister TL, Todt D, et al (2021) Comparison of the in vitro-efficacy of different mouthwash solutions targeting SARS-CoV-2 based on the European Standard EN 14476. *J Hosp Infect* 111:180–183. <https://doi.org/10.1016/j.jhin.2021.01.031>
69. Bidra AS, Pelletier JS, Westover JB, et al (2020) Comparison of In Vitro Inactivation of SARS CoV-2 with Hydrogen Peroxide and Povidone-Iodine Oral Antiseptic Rinses. *J Prosthodont* 29:599–603. <https://doi.org/10.1111/jopr.13220>
70. Meister TL, Gottsauner J-M, Schmidt B, et al (2022) Mouthrinses against SARS-CoV-2 – high antiviral effectivity by membrane disruption in vitro translates to mild effects in a randomized placebo-controlled clinical trial. *Virus Res* 316:198791.
<https://doi.org/10.1016/j.virusres.2022.198791>
71. Koch-Heier J, Hoffmann H, Schindler M, et al (2021) Inactivation of SARS-CoV-2 through Treatment with the Mouth Rinsing Solutions ViruProX® and BacterX® Pro. *Microorganisms* 9:521. <https://doi.org/10.3390/microorganisms9030521>
72. Muñoz-Basagoiti J, Perez-Zsolt D, León R, et al (2021) Mouthwashes with CPC Reduce the Infectivity of SARS-CoV-2 Variants In Vitro. *J Dent Res* 100:1265–1272.
<https://doi.org/10.1177/00220345211029269>
73. Chaudhary P, Melkonyan A, Meethil A, et al (2021) Estimating salivary carriage of severe acute respiratory syndrome coronavirus 2 in nonsymptomatic people and efficacy of mouthrinse in reducing viral load. *J Am Dent Assoc* 152:903–908.
<https://doi.org/10.1016/j.adaj.2021.05.021>

74. Ferrer MD, Barrueco ÁS, Martínez-Beneyto Y, et al (2021) Clinical evaluation of antiseptic mouth rinses to reduce salivary load of SARS-CoV-2. *Sci Rep* 11:24392. <https://doi.org/10.1038/s41598-021-03461-y>
75. Guenezan J, Garcia M, Strasters D, et al (2021) Povidone Iodine Mouthwash, Gargle, and Nasal Spray to Reduce Nasopharyngeal Viral Load in Patients With COVID-19. *Jama Otolaryngology Head Neck Surg* 147:400–401. <https://doi.org/10.1001/jamaoto.2020.5490>
76. Huang YH, Huang JT (2021) Use of chlorhexidine to eradicate oropharyngeal SARS-CoV-2 in COVID-19 patients. *J Med Virol* 93:4370–4373. <https://doi.org/10.1002/jmv.26954>
77. Seneviratne CJ, Balan P, Ko KKK, et al (2021) Efficacy of commercial mouth-rinses on SARS-CoV-2 viral load in saliva: randomized control trial in Singapore. *Infection* 49:305–311. <https://doi.org/10.1007/s15010-020-01563-9>
78. Alemany A, Perez-Zsolt D, Raïch-Regué D, et al (2022) Cetylpyridinium Chloride Mouthwash to Reduce Shedding of Infectious SARS-CoV-2: A Double-Blind Randomized Clinical Trial. *J Dent Res* 101:1450–1456. <https://doi.org/10.1177/00220345221102310>
79. Michalakakis Y, Sofonea MT, Alizon S, Bravo IG (2021) SARS-CoV-2 viral RNA levels are not “viral load.” *Trends Microbiol* 29:970–972. <https://doi.org/10.1016/j.tim.2021.08.008>
80. Barrueco ÁS, Mateos-Moreno MV, Martínez-Beneyto Y, et al (2022) Effect of oral antiseptics in reducing SARS-CoV-2 infectivity: evidence from a randomized double-blind clinical trial. *Emerg Microbes Infect* 11:1833–1842. <https://doi.org/10.1080/22221751.2022.2098059>
81. Tarragó-Gil R, Gil-Mosteo MJ, Aza-Pascual-Salcedo M, et al (2022) Randomized clinical trial to assess the impact of oral intervention with cetylpyridinium chloride to reduce salivary SARS-CoV-2 viral load. *J Clin Periodontol*. <https://doi.org/10.1111/jcpe.13746>
82. Bonn EL, Rohrhofer A, Audebert F-X, et al (2023) Efficacy of a mouthwash containing CHX and CPC in SARS-CoV-2 positive patients. *J Dent Res*. <https://doi.org/10.1177/00220345231156415>
83. Feres M, Figueiredo LC, Faveri M, et al (2010) The Effectiveness of a Preprocedural Mouthrinse Containing Cetylpyridinium Chloride in Reducing Bacteria in the Dental Office. *J Am Dent Assoc* 141:415–422. <https://doi.org/10.14219/jada.archive.2010.0193>
84. McCoy LC, Wehler CJ, Rich SE, et al (2008) Adverse events associated with chlorhexidine use Results from the Department of Veterans Affairs Dental Diabetes Study. *J Am Dent Assoc* 139:178–183. <https://doi.org/10.14219/jada.archive.2008.0134>
85. Haps S, Slot D, Berchier C, Weijden GV der (2008) The effect of cetylpyridinium chloride-containing mouth rinses as adjuncts to toothbrushing on plaque and parameters of gingival inflammation: a systematic review. *Int J Dent Hyg* 6:290–303. <https://doi.org/10.1111/j.1601-5037.2008.00344.x>

86. Below H, Brauer VF, Kramer A (2007) Absorption of iodine after antiseptics by iodophors and consequences to the risk assessment. *GMS Krankenhaushyg Interdiszip* 2:Doc41
87. Bescos R, Casas-Agustench P, Belfield L, et al (2020) Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. *J Dent Res* 99:1113–1113. <https://doi.org/10.1177/0022034520932149>
88. Mao X, Hiergeist A, Auer DL, et al (2022) Ecological Effects of Daily Antiseptic Treatment on Microbial Composition of Saliva-Grown Microcosm Biofilms and Selection of Resistant Phenotypes. *Front Microbiol* 13:934525. <https://doi.org/10.3389/fmicb.2022.934525>
89. Chatzigiannidou I, Teughels W, Wiele TV de, Boon N (2020) Oral biofilms exposure to chlorhexidine results in altered microbial composition and metabolic profile. *Npj Biofilms Microbiomes* 6:13. <https://doi.org/10.1038/s41522-020-0124-3>
90. Brookes ZLS, Belfield LA, Ashworth A, et al (2021) Chlorhexidine and oral microbiome. *J Dent* 113:103768. <https://doi.org/10.1016/j.jdent.2021.103768>
91. Brookes ZLS, Bescos R, Belfield LA, et al (2020) Current uses of chlorhexidine for management of oral disease: a narrative review. *J Dent* 103:103497. <https://doi.org/10.1016/j.jdent.2020.103497>
92. Tribble GD, Angelov N, Weltman R, et al (2019) Frequency of Tongue Cleaning Impacts the Human Tongue Microbiome Composition and Enterosalivary Circulation of Nitrate. *Front Cell Infect Microbiol* 9:39. <https://doi.org/10.3389/fcimb.2019.00039>
93. Bescos R, Ashworth A, Cutler C, et al (2020) Effects of Chlorhexidine mouthwash on the oral microbiome. *Sci Rep* 10:5254. <https://doi.org/10.1038/s41598-020-61912-4>
94. Auer DL, Mao X, Anderson AC, et al (2022) Phenotypic Adaptation to Antiseptics and Effects on Biofilm Formation Capacity and Antibiotic Resistance in Clinical Isolates of Early Colonizers in Dental Plaque. *Antibiotics* 11:688. <https://doi.org/10.3390/antibiotics11050688>
95. Schwarz SR, Hirsch S, Hiergeist A, et al (2021) Limited antimicrobial efficacy of oral care antiseptics in microcosm biofilms and phenotypic adaptation of bacteria upon repeated exposure. *Clin Oral Invest* 25:2939–2950. <https://doi.org/10.1007/s00784-020-03613-w>
96. Verspecht T, Herrero ER, Khodaparast L, et al (2019) Development of antiseptic adaptation and cross-adaptation in selected oral pathogens in vitro. *Sci Rep* 9:8326. <https://doi.org/10.1038/s41598-019-44822-y>
97. Muehler D, Mao X, Czernmel S, et al (2022) Transcriptomic Stress Response in *Streptococcus mutans* following Treatment with a Sublethal Concentration of Chlorhexidine Digluconate. *Microorganisms* 10:561. <https://doi.org/10.3390/microorganisms10030561>
98. Heider J, Müller LK, Arweiler N, et al (2021) S1-Leitlinie: “Umgang mit zahnmedizinischen Patienten bei Belastung mit Aerosol-übertragbaren Erregern”

99. Weber J, Bonn EL, Auer DL, et al (2023) Preprocedural mouthwashes for infection control in dentistry—an update. Clin Oral Invest 1–12. <https://doi.org/10.1007/s00784-023-04953-z>

**Befestigung von provisorischen Restaurationen und Probetragen von Zahnersatz:
Möglichkeiten und Materialien im Überblick**

- [1] Joda T, Pieger S, Heydecke G. Kronen- und Brückenprovisorien. Zahnmed Up2date. 2009; 3: 515–36.
- [2] Boisserée W. Zahnärztlich prothetische Maßnahmen nach Therapie einer kranio-mandibulären Dysfunktion. Man Med. 2003; 41 :224–9.
- [3] Rammelsberg P. Bisshebung – Möglichkeiten und Grenzen. Zahnmed Up2date. 2014; 8: 227–42.
- [4] Boeckler AF, Senke A. Die erfolgreiche Herstellung direkt gefertigter provisorischer Restaurationen. ZWR - Dtsch Zahnärztebl. 2006; 115: 569–73.
- [5] Edelhoff D, Güth J-F, Schweiger J, Maier B, Beuer F. Vorbehandlung komplexer Fälle in der festsitzenden Prothetik. Wissen Kompakt. 2010; 4: 3–16.
- [6] Abdullah AO, Pollington S, Liu Y. Comparison between direct chairside and digitally fabricated temporary crowns. Dent Mater J. 2018; 37: 957–63.
- [7] Abdullah AO, Tsitrou EA, Pollington S. Comparative in vitro evaluation of CAD/CAM vs conventional provisional crowns. J Appl Oral Sci Rev FOB. 2016; 24: 258–63.
- [8] Dieterich H. Temporäre Restaurationen als Schlüsselement zur Erarbeitung der Ästhetik. Quintessenz 2011; 62 (6): 759–767
- [9] Schmid A. Festsitzend, herausnehmbar, indirekt, direkt? Die richtige Wahl bei Provisorien. Junge Zahnarzt. 2022; 13: 40–3.
- [10] Leung GK-H, Wong AW-Y, Chu C-H, Yu OY. Update on Dental Luting Materials. Dent J. 2022; 10: 208.
- [11] Backhaus JL. Haftwirkung provisorischer Zemente [PhD Thesis]. Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU); 2021.
- [12] Markowitz K, Moynihan M, Liu M, Kim S. Biologic properties of eugenol and zinc oxide-eugenol: A clinically oriented review. Oral Surg Oral Med Oral Pathol. 1992; 73: 729–37.
- [13] Fujisawa S, Kadoma Y. Action of eugenol as a retarder against polymerization of methyl methacrylate by benzoyl peroxide. Biomaterials. 1997; 18: 701–3.
- [14] Garcia IM, Leitune VCB, Ibrahim MS, Melo MAS, Faus Matoses V, Sauro S, et al. Determining the Effects of Eugenol on the Bond Strength of Resin-Based Restorative Materials to Dentin: A Meta-Analysis of the Literature. Appl Sci. 2020; 10: 1070.
- [15] Gumus HO, Kurtulus IL, Kuru E. Evaluation and comparison of the film thicknesses of six temporary cements before and after thermal cycling. Niger J Clin Pract. 2018; 21: 1656–61.

- [16] Román-Rodríguez J-L, Millan-Martínez D, Fons-Font A, Agustín-Panadero R, Fernández-Estevan L. Traction test of temporary dental cements. *J Clin Exp Dent*. 2017; 9: e564–8.
- [17] Gross G, Schmohl L, Fuchs F, Guenther E, Schulz-Siegmund M, Schoengart J, et al. Retention force, translucency, and microstructural properties of translucent temporary luting cements: An in vitro study. *J Mech Behav Biomed Mater*. 2023; 142: 105781.
- [18] Almehmadi AH, Alghamdi F. Biomarkers of alveolar bone resorption in gingival crevicular fluid: A systematic review. *Arch Oral Biol*. 2018; 93: 12–21.
- [19] Cleaning and Conditioning of Contaminated Core Build-Up Material before Adhesive Bonding - PubMed [Internet]. [cited 2023 Jun 22]. Available from: <https://pubmed.ncbi.nlm.nih.gov/32604963/>
- [20] Ding J, Jin Y, Feng S, Chen H, Hou Y, Zhu S. Effect of temporary cements and their removal methods on the bond strength of indirect restoration: a systematic review and meta-analysis. *Clin Oral Investig*. 2023; 27: 15–30.
- [21] Haas Laura, Hahnel S. Temporäre Befestigung von festsitzendem Zahnersatz. *Mitteilungen DGZMK* [Internet]. 2023; Available from: <https://www.dgzmk.de/temporaere-befestigung-von-festsitzendem-zahnersatz1>
- [22] Leung GK-H, Wong AW-Y, Chu C-H, Yu OY. Update on Dental Luting Materials. *Dent J*. 2022; 10: 208.
- [23] Hill EE, Lott J. A clinically focused discussion of luting materials. *Aust Dent J*. 2011; 56 Suppl 1: 67–76.
- [24] Gupta A, Govila V, Saini A. Proteomics - The research frontier in periodontics. *J Oral Biol Craniofacial Res*. 2015; 5: 46–52.
- [25] Korsch M, Marten S-M, Dötsch A, Jáuregui R, Pieper DH, Obst U. Effect of dental cements on peri-implant microbial community: comparison of the microbial communities inhabiting the peri-implant tissue when using different luting cements. *Clin Oral Implants Res*. 2016; 27: e161–6.

Veneerversorgungen nach kieferorthopädischer Vorbehandlung

Ein multidisziplinärer Behandlungsansatz

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1. Abduo J. Safety of increasing vertical dimension of occlusion: a systematic review. Quintessence Int 2012; 43: 369–380.
2. Aboushelib MN, Sleem D. Microtensile bond strength of lithium disilicate ceramics to resin adhesives. J Adhes Dent 2014; 16: 547–552.
3. Ahlers MO, Möller K. Labortechnische Herstellung von Repositions-Onlays und -Veneers. Quintessenz 2010; 36: 498–511.
4. Ahlers M O, Möller K. Repositions-Onlays und -Veneers zur atraumatischen Restauration einer physiologischen Kiefer- und Kondylenposition. Quintessenz 2011; 62: 211–222.
5. Ahlers MO, Edelhoff D. Einsatz glaskeramischer Repositions-Onlays zur Abschlussbehandlung nach erfolgreicher Funktionstherapie. Quintessenz 2015; 66: 1509–1525.
6. Allgeier S, Hahn B, Krastl G. Direkte Frontzahnrestorationen aus Komposit. Wissen Kompakt 2019; 13 (3): 1903-112.
7. Araujo E, Perdigao J. Anterior Veneer Restorations – An Evidence-based Minimal-Intervention Perspective. J Adhes Dent 2021; 23: 91–110.
8. Aristidis GA, Dimitra B. Five-year clinical performance of porcelain laminate veneers. Quintessence Int 2002; 33: 185–189.
9. Attin T, Filli T, Imfeld C, Schmidlin P R. Composite vertical bite reconstructions in eroded dentitions after 5.5 years: a case series. J Oral Rehabil 2012; 39: 73–79.
10. Attin T, Bosch G, Wegehaupt FJ, Mehl A, Wiegand A., Blunck U. Rekonstruktion erosiver Zahnhartsubstanzdefekte mit Komposit. Quintessenz 2015; 66: 1055–1069.
11. Attin, T, Tauböck TT. Direkte adhäsive Komposit-Restaurationen zur Rekonstruktion erosiver Zahnhartsubstanzdefekte. Swiss Dental Journal SSO 2017; 127: 131–137.
12. Aykor A, Ozel E. Five-year clinical evaluation of 300 teeth restored with porcelain laminate veneers using total-etch and a modified self-etch adhesive system. Oper Dent 2009; 34: 516–523.
13. Barghi, N., McAlister, E.: Porcelain for Veneers. J Esth Dent 1998; 10: 191–197.
14. Bartlett D. A personal perspective and update on erosive tooth wear - 10 years on: Part 2 - Restorative management. Br Dent J 2016; 221: 167–171.
15. Bock T, Özcan M. Protocol for Removal of Clinically Relevant Contaminants from Glass Ceramic-based Restorations. J Adhes Dent 2015; 17: 474-475.

16. Bömicke W, Rammelsberg P, Krisam J, Rues S. The Effects of Surface Conditioning and Aging on the Bond Strength Between Composite Cement and Zirconia reinforced Lithium-Silicate Glass-Ceramics. *J Adhes Dent* 2019; 21: 567–576.
17. Bottino MA, Snellaert A, Bergoli CD, Özcan M, Bottino MC, Valandro LF. Effect of ceramic etching protocols on resin bond strength to a feldspar ceramic. *Oper Dent* 2015; 40: 40–46.
18. Brix O, Edelhoff D. Die Rekonstruktion eines Lächelns. Ästhetische und funktionelle Rekonstruktion eines Dentinogenesis-imperfecta- Patienten mit Lithiumdisilikat-Glaskeramik. *Quintessenz Zahntechnik* 2011; 37: 16–27.
19. Bumann A, Lotzmann U. Funktionsdiagnostik und Therapieprinzipien (8. Auflage). Rateitschak KH, Wolf HF, Editors: Thieme (2015)
20. Edelhoff D. Okklusionsveränderung mit Kauflächen-Veneers: CAD/CAM-gefertigte Table Tops korrigieren die Bisslage. *Zahnärztliche Mitteilungen* 2014; 104: 48–50.
21. Edelhoff D, Ahlers O. Okklusionsonlays als modernes Behandlungskonzept für die Rekonstruktion stark substanzgeschädigter Kauflächen. *Quintessenz* 2018; 69: 2–15.
22. Edelhoff D, Prandtner O, Saeidi Pour R, Liebermann A, Stimmelmayer M, Güth JF. Frontzahnrestaurationen: Leistungsfähigkeit von Keramikveneers. *Wissen Kompakt* 2019; 13 (3): 115–1278.
23. Ernst CP. Omnicroma Flow: Die perfekte Ergänzung zum pastösen Original. *ZMK* 2022; 38: 176–179.
24. Ernst CP. Fallbeispiele zum ästhetischen Indikationsspektrum von Tetric Prime im Frontzahnbereich. *ZMK* 2021; 37: 542–552.
25. Ernst CP. Haltbarkeit von direkten Kompositaufbauten an Schneidezähnen nach FZT-Versorgung. *ZMK* 2021; 37: 90–102.
26. Ernst, CP. Ein universelles adhäsives Befestigungs- und Stumpfaufbaumaterial. *ZMK* 2020; 36: 294–308.
27. Ernst CP. Bevorstehende Hochzeit: Ästhetische Notfallbehandlung in der Corona-Zeit. *ZMK* 2020; 36: 698–701
28. Ernst CP. Diastemaschluss mit einer einzigen Universalfarbe. *ZMK* 2020; 36: 220–225.
29. Ernst CP. Ein praxistaugliches neues Schichtkonzept für Ceram.x Spectra ST. *ZMK* 2020; 36: 048–059.
30. Ernst CP. Schichtkonzepte bei vereinfachten Frontzahnkompositsystemen. *ZMK* 2018; 34: 570–59.
31. Ernst CP. Direkte Frontzahnrestaurationen aus Komposit – aktuelle Studienlage und Fallbeispiele. *ZMK* 2017; 33: 2–8.
32. Ernst CP. Reshaping of Incisors – Challenges with an easy Solution. *Private Dentistry*, June 2017; 60–62.

33. Ernst CP. Die korrekte Vorbehandlung indirekter Restaurationen zur adhäsiven Befestigung. ZMK 2017; 33: 98–110.
34. Ernst CP. Reshaping of Incisors – An easy Solution. Private Dentistry, May 2017; 58–62.
35. Ernst CP. Keramikeilkronen als Versorgungsoption von Zähnen mit Infraktionen. All ceramic partial crowns as a treatment option for cracked, but symptomless teeth. Deutsche Zahnärztl Z 2015; 70: 165–173.
36. Ernst CP. Schneidezähne in Form gebracht. ZMK 2014; 30: 636–647.
37. Ernst CP. Verschalungstechnik einmal anders. ZMK 2012; 28: 318–324.
38. Fradeani M, Redemagni M, Corrado M. Porcelain laminate veneers: 6- to 12-year clinical evaluation – a retrospective study. Int J Periodontics Restorative Dent 2005; 25: 9–17.
39. Frankenberger R, Hartmann VE, Krech M, Krämer N, Reich S, Braun A, Roggendorf. Adhesive luting of new CAD/CAM materials. Int J Comput Dent 2015; 18: 9–20.
40. Frankenberger R, Hehn J, Hajto N, Krämer N, Naumann M, Koch A, Roggendorf MJ. Effect of proximal box elevation with resin composite on marginal quality of resin composite inlays in vitro. Clin Oral Investig 2013; 17: 177–183.
41. Frankenberger R, Lohbauer U, Taschner M, Petschelt A, Nikolaenko SA. Adhesive luting revisited: influence of adhesive, temporary cement, cavity cleaning, and curing mode on internal dentin bond strength. J Adhes Dent. 2007; 9 Suppl 2: 269–273.
42. Gehrt M, Wolfart S, Rafai N, Reich S, Edelhoff D. Clinical results of lithium-disilicate crowns after up to 9 years of service. Clin Oral Investig 2013; 17: 275–284.
43. Giraldo TC, Villada VR, Castillo MP, Gomes OM, Bittencourt BF, Dominguez JA. Active and Passive Application of the Phosphoric Acid on the Bond Strength of Lithium Disilicate. Braz Dent J 2016; 27: 90–94.
44. Hajto J. Veneers Materialien und Methoden im Vergleich. Teamwork 2000; 3: 195–202.
45. Hajto J. Frontzahnrestaurationen: Sind Keramikveneers die beste Wahl? Quintessenz 2010; 61: 521–528.
46. Hajto J. Veneers – eine wertvolle Ergänzung für jede Praxis. Cosmetic Dentistry 2018; 16: 18–21.
47. Hamburger J T, Opdam N J, Bronkhorst E M, Kreulen C M, Roeters J J, Huysmans M C. Clinical performance of direct composite restorations for treatment of severe tooth wear. J Adhes Dent 2011; 13: 585–593.
48. Hormes M, Ernst CP. Adhäsive Vollzirkonteilkronen nach mucogingivalchirurgischer Vorbehandlung. ZMK 2022, 38: 74–81.
49. Ilgenstein I, Zitzmann NU, Bühler J, Wegehaupt FJ, Attin T, Weiger R, Krastl G. Influence of proximal box elevation on the marginal quality and fracture behavior of root-filled molars restored with CAD/CAM ceramic or composite onlays. Clin Oral Investig 2015; 19: 1021–1028.
50. Kalavacharla VK, Lawson NC, Ramp LC, Burgess JO. Influence of Etching Protocol and Silane

Treatment with a Universal Adhesive on Lithium Disilicate Bond Strength. *Oper Dent* 2015; 40: 372–378.

51. Kunzelmann KH, Kern M. Das Keramik Veneer. Substanzschonend und ästhetisch. *Dental Magazin* 2005; 4: 36–41.
52. Lise D, Perdigão J, Van Ende A, Zidan O, Lopes G. Microshear Bond Strength of Resin Cements to Lithium Disilicate Substrates as a Function of Surface Preparation. *Oper Dent* 2015; 40: 524–532
53. Magne P., Douglas, W.H.: Additive Contour of Porcelain Veneers: A Key Element in Enamel Preservation, Adhesion, and Esthetics for Aging Dentition. *J Adhesive Dent* 1999; 1, 81–92.
54. Magne P, Stanley K, Schlichting L H. Modeling of ultrathin occlusal veneers. *Dent Mater* 2012; 28: 777–782.
55. Magne P, Spreafico RC. Deep Margin Elevation: A Paradigm Shift. *Am J Esthet Dent* 2012; 2: 86–96.
56. Manhardt J. Temporäre Anhebung der Vertikaldimension mit Komposit in einem vereinfachten direkten Spritzgussverfahren. *Swiss Dental Journal SSO* 2017; 127: 413–429
57. Müller V, Friedl KH, Friedl K, Hahnel S, Handel G, Lang R. Influence of proximal box elevation technique on marginal integrity of adhesively luted Cerec inlays. *Clin Oral Investig* 2017; 21: 607–612.
58. Muts E J, Van Pelt H, Edelhoff D, Krejci I, Cune M: Tooth wear: a systematic review of treatment options. *J Prosthet Dent* 2014; 112: 752–759.
59. Neto DS, Naves LZ, Costa AR, Correr AB, Consani S, Borges GA, Correr-Sobrinho L. The Effect of Hydrofluoric Acid Concentration on the Bond Strength and Morphology of the Surface and Interface of Glass Ceramics to a Resin Cement. *Oper Dent* 2015; 40: 470–479
60. Opdam N, Skupien JA, Kreulen CM, Roeters J, Loomans B, Huysmans MD. Case Report: A Predictable Technique to Establish Occlusal Contact in Extensive Direct Composite Resin Restorations: The DSO-Technique. *Oper Dent* 2016; 41 (S7): S96–S108.
61. Opdam NJ, Roeters JJ, de Boer T, Pesschier D, Bronkhorst E. Voids and porosities in class I micropreparations filled with various resin composites. *Oper Dent* 2003; 28: 9–14.
62. Politano G, Van Meerbeek B, Peumans M. Nonretentive Bonded Ceramic Partial Crowns: Concept and Simplified Protocol for Long-lasting Dental Restorations. *J Adhes Dent* 2018; 20: 495–510.
63. Reiner A. “margin elevation technique”. *zm* 2013; 103: 44–46.
64. Rocca GT, Gregor L, Sandoval MJ, Krejci I, Dietschi D. In vitro evaluation of marginal and internal adaptation after occlusal stressing of indirect class II composite restorations with different resinous bases and interface treatments. "Post-fatigue adaptation of indirect composite restorations". *Clin Oral Investig* 2012; 16: 1385–1393
65. Roggendorf MJ, Krämer N, Dippold C, Vosen VE, Naumann M, Jablonski-Momeni A, Frankenberger R. Effect of proximal box elevation with resin composite on marginal quality of resin composite inlays in vitro. *J Dent* 2012; 40: 1068–1073. Magne P, Spreafico RC. Deep Margin Elevation: A Paradigm

Shift. Am J Esthet Dent 2012; 2: 86–96.

66. Roulet JF. Reasonable Adhesion. J Adhes Dent 2010; 12: 255.
67. Schmidlin PR, Filli T, Imfeld C, Tepper S, Attin T. Three-year evaluation of posterior vertical bite reconstruction using direct resin composite – a case series. Oper Dent 2009; 34: 102–108.
68. Sidharta JJ. Veneer-System: Ästhetische Korrekturen minimalinvasiv durchführen ZMK 2014; 30: 672–673.
69. Simeone P, Gracis S. Eleven-Year Retrospective Survival Study of 275 Veneered Lithium Disilicate Single Crowns. Int J Periodontics Restorative Dent 2015; 35: 685–694.
70. Steeger B. Survival analysis and clinical follow-up examination of all-ceramic single crowns. Int J Comput Dent 2010; 13: 101–119.
71. Tauböck T T, Schmidlin P R, Attin T. Bisshebung mit Komposit im Erosionsgebiss. wissen kompakt 2011; 5: 23–32.
72. Tauböck T T, Attin T, Schmidlin P R. Implementation and experience of a new method for posterior vertical bite reconstruction using direct resin composite restorations in the private practice – a survey. Acta Odontol Scand 2012; 70: 309–317.
73. Tauböck T T, Attin T. Restauration fortgeschrittener Zahnhartsubstanzverluste mit Komposit. Zahnärztliche Mitteilungen 2016; 106: 48–56.
74. Teichmann M, Gockler F, Weber V, Yildirim M, Wolfart S, Edelhoff D. Ten-year survival and complication rates of lithium-disilicate (Empress 2) tooth-supported crowns, implant-supported crowns, and fixed dental prostheses. J Dent 2017; 56: 65–77.
75. Tian T, Tsoi JK, Matinlinna JP, Burrow MF. Aspects of bonding between resin luting cements and glass ceramic materials. Dent Mater 2014; 30:e 147–162.
76. Toman M, Toksavul S. Clinical evaluation of 121 lithium disilicate all-ceramic crowns up to 9 years. Quintessence Int 2015; 46: 189–197.
77. Valenti M, Valenti A. Retrospective survival analysis of 261 lithium disilicate crowns in a private general practice. Quintessence Int 2009; 40: 573–579.
78. Valenti M, Valenti A. Retrospective survival analysis of 110 lithium disilicate crowns with feather-edge marginal preparation. Int J Esthet Dent 2015; 10: 246–257.
79. Werling G, Werling U. Lithiumdisilikat, die unbemerkte Revolution in der Vollkeramik? Teil 2. ZMK 2011; 27: 322–326.
80. Wicht MJ, Wolff D. (2016) Matrizentechnik – physiologische Gestaltung approximaler Kontaktflächen im Front- und Seitenzahnbereich. Quintessenz 2016; 67(4): 1–10.
81. Wiedhahn K, Kerschbaum T, Fasbinder DF. Clinical long-term results with 617 Cerec veneers: a nine-year report. Int J Comput Dent 2005; 8: 233–246.

82. Zahn T, Zahn B, Gerhardt-Szep S, Lauer HC. Re-konstruktion generalisierter Erosionsschäden durch vollkeramische Restaurationen – ein Fallbericht mit Langzeitergebnissen nach 6 Jahren. Dtsch Zahnärztl Zeitschr 2014; 69: 698–706.
83. Zaruba M, Göhring TN, Wegehaupt FJ, Attin RT. Influence of a proximal margin elevation technique on marginal adaptation of ceramic inlays. Acta Odontol Scand 2013; 71: 317–324.

